DOCUMENT RESUME

ED 179 932 CS 005 156

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TITLE The Reliability and Validity of the Concepts About Print and Record of Oral Language.
PUB DATE [78]
NOTE 42p.; Study prepared at Texas Woman's University

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Grade 1; Kindergarten; Primary Education; *Reading Diagnosis; *Reading Readiness; *Reading Readiness Tests; *Reading Research; *Test Reliability; *Test Validity

ABSTRACT

The Concepts about Print (Sand) and Record of Oral Language (ROL) tests were administered three times to 29 male and 27 female kindergarten children as part of a study to determine the reliability and concurrent validity of the tests. The Sand and Metropolitan Readiness Test (MRT) were administered to the returning participants (27 males and 24 females) at the beginning of their first grade year. Intercorrelations of the Sand, ROL, and MRT subtests and composite scores were high, even when the Sand and ROL preceded the MRT by one year. Canonical correlations, using the concurrent Sand and ROL as one variable set and the MRT subtests as the second variable set, were as high as .87. Multiple and partial correlational analyses suggested that the Sand test and the MRT subtests for sound-letter correspondence, visual matching, and finding patterns measured similar abilities. The ROL and the MRT subtests for beginning consonants, school language, and listening also had considerable common variance. These findings reflect not only the reliability of the Sand and ROL but also their concurrent validity. The results support the use of the Sand and ROL tests in the early diagnosis and monitoring of language problems that may produce later reading difficulties. (Author/RL)

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The Reliability and Validity of the Concepts About Print and Record of Oral Language

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ABSTRACT

Twenty-nine male and 27 female kindergarten students were administered the Concepts About Print (Sand) and Record of Oral Language (ROL) on three occasions during their kindergarten year. The Sand and Metropolitan Readiness Test (MRT) were administered to the returning participants at the beginning of their first grade year. Test-retest reliability coefficients of the Sand test ranged from .73 to .89; while similar coefficients for the ROL ranged from .92 to .95. Corrected split-half coefficents of .84 to .88 for the Sand and .94 to .95 for the ROL were found. Intercorrelations of the Sand, ROL, and MRT subtest and composite scores were high, even when the Sand and ROL preceded the MRT by one year. Canonical correlations between the concurrent Sand and ROL as one variable set and the MRT subtests as the second variable set were as high as .87. Multiple and partial correlational analyses suggested that the Sound-letter Correspondence, Visual Matching, and Finding Patterns subtests of the MRT and the Sand test measured similar abilities and that the Beginning Consonants, School Language, and Listening subtests of the MRT and the ROL had considerable common variance. It was concluded that these findings reflect the reliability of the Sand and ROL

and the concurrent validity of the Sand and ROL using the MRT subtests as criteria and support the early application of the Sand and ROL to the diagnosis and monitoring of language problems that may be related to later difficulties in learning to read.

The Reliability and Validity of the Concepts About Print and Record of Oral Language

The Concepts About Print (Sand) and the Record of Oral Language (ROL) tests have been developed by Clay (1) and Clay, Gill, Glynn, McNaughton, and Salmon (2), respectively, to assess the degree to which the child possesses reading-related concepts and linguistic abilities thought to be important in the acquisition of reading skills. The Sand test uses a child's book entitled Sand that the child is asked to help the interviewer read. During the 10-minute interview, the child responds to 24 questions to determine if the child understands such things as rules of directionality, differences between letters and words, simple use of capitalization and punctuation, etc. The test may be diagnostically beneficial in working with children who are experiencing difficulties in learning to read and may be used to monitor a child's progress through a reading program (1).

The ROL was developed so that teachers would be able to "observe aspects of a child's control over oral language and assess a child's ability to handle selected grammatical structures" (2, p. 3). The ROL consists of the Levels Sentences and Diagnostic Sentences sections and requires the child to repeat sentences of various syntactic structures

read by the interviewer. The Levels Sentences are grouped on the basis of three levels of difficulty, and within each level of difficulty there are seven types of sentences, each differing in its grammatical structure. Since there are two examples of each sentence type within each level, a child may score between zero and 42 on the Levels Sentences. The set of first examples make up Part 1 and the second examples make up Part 2. The Diagnostic Sentences provide a more thorough assessment of a child's language performance and are administered at the discretion of the teacher after the Levels Sentences. Clay et al. (2) state that with the ROL the teacher can learn as much about the child's control of syntactic structures in a short period of time as could be learned by listening to the child's spontaneous speech over a much longer period of time. Such knowledge can then be used to group children for teaching purposes and to guide the teacher in the use of particular grammatical structures with specific children.

Recent interest in the application of Clay's tests to American children has been expressed (e.g., 5). Since the only available information concerning the reliability and validity of the Sand and ROL has come from the performance of Auckland, New Zealand, public school students (1, 2), additional study of the statistical characteristics of these tests seems warranted. The purpose of this study, therefore,

was to determine the reliability and concurrent validity of the Sand and ROL tests with a group of American children.

Method

Subjects

The participants were 29 male and 27 female kindergarten students enrolled in the public school system of a Southwestern suburban community of approximately 50,000 residents. To recruit these participants, a list of the families having a child enrolled in kindergarten classes of the four participating schools at the beginning of the 1977-78 school year was obtained. Of the resulting 265 families, those were excluded whose child could not speak and/or understand English, whose child was six years of age before September 1, 1977, or whose child had a perceptual or motor handicap that would interfere with adequate response to tests. Sixteen families were excluded for these reasons. From the remaining group of 249 families, a sample of 75 families was randomly selected. Parents or guardians of 61 (81.3%) of the selected 75 families consented to the participation of their child in the study. Five boys and five girls of these 61 children (18%) were members of an ethnic-minority group, a percentage very close to the 16.8% minority enrollment for the school district during the 1975-76 school year. Two boys and three girls were only

available for the first testing and were, therefore, excluded from the analysis. The remaining 29 boys had a mean (and standard deviation) age of 68.2 (±3.3) months; while the remaining 27 girls had a mean age of 69.1 (±3.8) months.

Testing

The Sand test and the Levels Sentences of the ROL test were given to the participants on three occasions during the kindergarten year: first, during the period of November 16 to December 5, 1977; second, from January 9 to January 17, 1978; and third, from February 27 to March 9, 1978. Twenty-seven males and 24 females returned to the school system the following year and were given the Sand test on a fourth occasion during the period of September 21-28, 1978. Metropolitan Readiness Test (MRT) scores were obtained as a result of the routine administration of the test by the school system during September, 1978; however, since two boys were retained in kindergarten and a third boy was referred to a resource room, MRT scores were available for only 24 of the returning males. To obtain the first three measurements of the ROL and Sand, the two tests were administered to each child in a single interview occurring in a quiet setting away from other children. Within each measurement occasion, the order of testing was alternated

across participants. Each interview was audio recorded, and the child's responses were verified during a later playback.

With the agreement of one of the authors of the ROL (3), six words or phrases appearing in the ROL that seemed to be infrequently used in American English were replaced with their American English synonyms. The following changes were made: "kitty" for "pussy" in Level 1, Part 1, Type B; "Kelly" for Kiri" in Level 2, Part 1, Type D; "stroller" for "pushchair" in Level 2, Part 2, Type F; "mommy" for "mummy" in Level 3, Part 1, Type D; "outside" for "under" in Level 3, Part 1, Type G; and "mailman" for "postman" in Level 3, Part 2, Type B.

Results

Reliability Studies

The means and standard errors of the three ROL measurements, ROL1 through ROL3, and of the four administrations of the Sand test, Sand1 through Sand4, are presented for males, females, and the combination of males and females in Table 1. Clay et al. (2) report a mean of 22.3 and standard deviation of 9.2 for the Levels Sentences compared to our ROL1 mean of 22.0 and standard deviation of 10.6. Clay (1) found means of 8.0 to 15.3 on the Sand test for different beginning reading groups, and our means of students who were mostly

prereaders ranged from 7.7 to 13.0 for the total sample.

Insert Table 1 about here

Test-retest reliability coefficients were determined for the ROL by computing intercorrelations of the total scores obtained on the three occasions. The resulting Pearson coefficients for males, females, and males and females combined are presented in Table 2. Similar intercorrelations of the total scores resulting from the four administrations of the Sand test may also be noted in Table 2. To provide correlations of Sand4 with the other Sand administrations, the mean of the male Sand4 scores or the mean of the female Sand4 scores was substituted for the missing male or female data.

Insert Table 2 about here

The coefficients in Table 2 reveal that both the ROL and the Sand tests have very good stability across time. It is remarkable that the lag-two coefficients for the ROL are generally equal to or higher than the coefficients for the first lag, and even the coefficients for the third lag of the Sand test, spanning nearly one year, are all .73 or

above for the total sample. It may also be noted that the coefficients for males and females do not appreciably differ.

Split-half reliability coefficients for the ROL were determined by correlating scores on Part 1 with scores on Part 2. Odd-even correlations produced the split-half coefficients for the Sand test. The resulting coefficients corrected by the Spearman-Brown method are presented in Table 3. While these coefficients are consistently high for both tests, some may underestimate the existing internal consistency because, as may be noted in Table 4, the two halves in all cases for the Sand test and in some cases for the ROL tests do not have equal means (4). For Sand1 through Sand4, the Kuder-Richardson (20) coefficients were .81, .79, .86, and .91 for males and .83, .83, .85, and .93 for females. The alpha coefficients for the total sample were .83, .83, .86, and .92 for Sand1 through Sand4, respectively. Similar coefficients for the ROL have not been computed.

Insert Tables 3 and 4 about here

Validity Studies

The MRT subtest means and standard deviations for the available 24 males and 24 females are presented in Table 5.

One-group *t* tests between the sample subtest means and the comparable subtest means reported as norms for the MRT (6) attested to the representativeness of the scores of our sample (see Table 5).

Insert Table 5 about here

The correlations between the Sand and ROL are presented in Table 6, and it may be noted that the correlations are quite high; even the coefficient spanning nearly a year, that between ROL1 and Sand4, is .59. The intercorrelations of the MRT subtests, the MRT composite scores, and Sand4 are presented in Table 7. The correlations of the other Sand administrations and the three administrations of the ROL with the MRT subtest and composite scores are listed as zero-order partial coefficients in Table 11. These tables reveal that both the Sand and ROL on all testing occasions are positively correlated with all subtests of the MRT. In most cases the correlations are substantial and, for the most part, unchanged by a lag of one year between the two tests. The correlations between both of Clay's tests and the Battery Composite score of the MRT are remarkably high, being above .70 in all cases except ROL1.

Insert Tables 6 and 7 about here

The multiple correlations produced by the regression of the MRT subtests on the concurrent Sand and ROL tests appear in Table 8. A comparison of these coefficients with the bivariate coefficients discussed in the preceding paragraph reveals that the multiple Rs are not appreciably larger than the correlations between even Sandl and the MRT subtests. While the correlations between the ROL and MRT subtests are generally high for each ROL administration, it seems that if predicting performance on particular MRT subtests in the first grade is the goal and a single predictor is employed, the Sand might be a slightly better choice than the ROL when used during the kindergarten year.

Insert Table 8 about here

Table 9 presents canonical correlation coefficients obtained by considering concurrent Sand and ROL scores as one variable set and the subtests of the MRT as the second variable set. Separate analyses were performed for the inclusion and exclusion of the two quantitative subtests. The most striking findings of these analyses are the very high correlations produced by the combination of Clay's tests and the subtests of the MRT. Interpreting the squared canonical coefficients, it is apparent that 74% of the variability in the linear composite of the MRT subtests is

shared with that of the composite of the Sand and ROL administered a year earlier, and the other relationships are nearly as strong. The regression coefficients for the canonical variables are also given in Table 9, and it may be noted that whereas the bivariate correlations with the MRT subtests are generally slightly larger for the Sand than for the ROL, the ROL is weighted slightly heavier than the Sand in the canonical analyses. In these analyses, only the pre-reading skills subtests labeled Beginning Consonants, School Language, and Listening contribute to the correlations to a substantial degree. The correlation of Sand1 and ROL1 with the pre-reading subtests produced a second canonical correlation that is barely significant at the .05 level, and Table 9 reveals that Beginning Consonants, Sound-letter Correspondence, and Visual Matching contribute to this relationship.

Insert Table 9 about here

Since the bivariate correlations of the MRT with the Sand were slightly larger than with the ROL and since the ROL contributed more to the canonical correlations than the Sand, further analyses were conducted. The relative contributions of the Sand and ROL in predicting the MRT subtest and composite scores were examined by entering the ROL and

Sand scores, along with the age and sex of the participant, into a stepwise regression analysis using the forward stepwise method. The resulting multiple correlation coefficients and beta weights of the variables that produced increments in R significant at the .01 level are presented in Table 10. The Sand and ROL contribute approximately equally in the prediction of the Battery Composite and Prereading Composite scores and approximately equally in the prediction of the Quantitative score except at the March, 1978 administration when ROL3 is weighted much heavier. The beta weights for the Sand and ROL are also similar in magnitude in the prediction of the Beginning Consonants and Finding Patterns subtests. The Sand, however, explains, by far, the greater amount of variance of the Sound-letter Correspondence and Visual Matching subtests, and the ROL is a much better predictor of School Language and Listening than the Sand. On the first two administrations, the Sand and ROL contribute about equally to the prediction of Quantitative Concepts and Quantitative Operations, but on the third administration, little variance in these two subtests is accounted for by the Sand. The regression of Quantitative Concepts and Quantitative Operations on Sand4, age, and sex, however, produced multiple correlations of .47 and .71 with beta weights for Sand4 of .42 and .53, respectively.

Insert Table 10 about here

In Table 11 the correlations between the Sand and the MRT subtests with the ROL controlled and the correlations between the ROL and MRT with the Sand controlled are presented for each testing occasion. While considerable differences between the zero-order and first-order partial coefficients occur for all of the analyses in this table, the largest differences are consistent with the results of the canonical and multiple correlational analyses. With Sand controlled, the correlations between ROL and Sound-letter Correspondence, Visual Matching, and Finding Patterns become nonsignificant ($p > .05$). Similarly, large decreases, and mostly to a nonsignificant level, in the correlations between the Sand and the Beginning Consonants, School Language, and Listening subtests occur when the ROL is controlled. While the relationship between Quantitative Operations and the Sand holds up under this partialling somewhat better than the ROL does, both the Sand and ROL seem to account for the same amount of variance in the Quantitative Concepts subtests.

Insert Table 11 about here

The concurrent administrations of the Sand and ROL and the MRT subtests were subjected to a factor analysis that extracted initial factors using the method of principal factoring with iteration. A terminal solution was obtained by obliquely rotating the initial factors according to the direct oblimin criterion. Since this rotation produced two factors that are highly correlated (.71 and -.72), the initial factors were subjected to a varimax rotation for comparison with the results of the oblique solution. It was expected that the Sand and ROL would load differently on factors suggested by the pattern of relationships appearing in the previous analyses.

Table 12 shows that for the first and third administrations of the Sand and ROL, two factors were detected, the first accounting for nearly 90% of the variance and the second having an eigenvalue less than one. The factor analysis of the ROL2, Sand2, and MRT scores produced a single factor with moderate to high loadings for all of the variables. The varimax rotations reported in Table 12 generally showed at least low loadings for all variables on the first factor.

Insert Table 12 about here

While our expectations concerning the factor analyses were not confirmed, the oblique rotations reveal a clear pattern on both analyses producing two factors. The highest loadings on the first factor are for the Beginning Consonants, Sound-letter Correspondence, Visual Matching, Finding Patterns, Quantitative Concepts, and Quantitative Operations subtests. The School Language and Listening subtests of the MRT and the Sand and ROL load highly on the second factor. In the scoring of the MRT, Beginning Consonants and Sound-letter Correspondence are combined to produce what is called an Auditory score; Visual Matching and Finding Patterns produce a Visual score; and Quantitative Concepts and Quantitative Operations are summed to obtain a Quantitative score. Similarly, School Language and Listening are combined into a Language score. Therefore, in addition to the demonstration of a great deal of common variance among the Sand, ROL, and MRT subtests, the factor analyses produced two groupings of variables: Auditory, Visual, and Quantitative on the one hand, and the ROL, the Sand, and Language on the other.

Discussion

Within the limitations of the psychometrically small sample size, this study demonstrates the reliability and validity of the Sand and ROL and supports the use of both

tests in the study of reading problems and other aspects of reading behavior with American children. Clay (1) reported a reliability coefficient (split-half?) of .95 in her normalization study of the Sand; while our Spearman-Brown estimates ranged from .84 to .88, and our Kuder-Richardson coefficients were from .83 to .92 for the total sample. Clay et al. (2) found a Kuder-Richardson(20) reliability coefficient of .93 for the ROL, which is similar to our split-half coefficients of .94 to .95. The reliability of both tests, therefore, seem to be very similar for these American and New Zealand children.

The rather surprising finding of very high canonical correlations of the kindergarten administrations of the Sand and ROL with the subtests of the MRT supports the careful application of Clay's tests in kindergarten to problems currently approached with the MRT in the first grade. While the present findings do not delineate the methodology of specific applications, these high correlations indicate the potential usefulness of the Sand and ROL in identifying children early in their kindergarten year who will later perform poorly on first grade readiness tests and, therefore, possibly experience difficulty in learning to read. Such early objective knowledge of language abilities would aid the teacher in grouping kindergarten children for optimal pre-reading instruction. The high correlations of

Sand4 with the MRT indicates that the Sand may be useful in verifying and elaborating the readiness or lack of readiness revealed by the MRT in the first grade. Additional study of the behavior of the Sand and ROL throughout the first-grade year seems warranted.

While the Sand, ROL, and MRT seem to share considerable common variance, the multiple, canonical, and partial correlational analyses reveal that the Sand and ROL to some degree measure different aspects of early linguistic behavior. The discriminant validity of the ROL is demonstrated by its association with the Beginning Consonants, School Language, and Listening subtests of the MRT. According to the MRT test manual (6, pp. 6-7), Beginning Consonants measures "an important auditory decoding skill and the ability to discriminate among the initial sounds of words." School Language measures "basic cognitive concepts as well as simple and more complex grammatical structures. . . using standard American English," and Listening measures "the ability to integrate and reorganize information, to draw inferences, and to analyze and evaluate material presented orally." The ROL and these subtests of the MRT, therefore, all seem to assess the child's ability to attend to, and respond on the basis of, salient aspects of the spoken word.

Sound-letter Correspondence of the MRT involves "identifying letters corresponding to specific sounds in words;" Visual Matching involves the ability to discriminate among visual symbols and measures "visual-perceptual skill in matching letters, numerals, and letter-like forms." Finally, Finding Patterns assesses "the ability to separate a pattern visually from the context in which it is placed." These three MRT subtests and the Sand seem to be similar in that they all require the child to respond to aspects of language presented on the print medium.

NOTE

1. This paper is based in part on data from the dissertation of the second author, then Kaaren C. Perkins, submitted to the Graduate School, Texas Woman's University, 1978.

REFERENCES

1. Clay, M. M. Reading: The Patterning of Complex Behavior. Auckland, New Zealand: Heinemann Educational Books, 1972.

2. Clay, M. M.; Gill, W. N.; Glynn, E. L.; McNaughton, A. H.; Salmon, K. W. Record of Oral Language. Wellington, New Zealand: New Zealand Educational Institute, 1976.

3. Glynn, E. L. Personal Communication. August, 1977.

4. Guilford, J. P. and Fruchter, B. Fundamental Statistics in Psychology and Education. New York: McGraw-Hill, 1978.

5. McDonell, G. M. and Osburn, E. B. "New Thoughts about Reading Rediness." Language Arts 55(1978): 26-29.

6. Nurss, J. R. and McGauvran, M. E. Metropolitan Readiness Tests Teacher's Manual, Part II: Interpretation and Use of Test Results. New York: Harcourt Brace Javanovich, 1976.

Table 1.--Mean ± Standard Errors of the ROL and Sand Measurements

Test	Males	Females	Total
ROL1	20.8 ± 1.9	23.3 ± 2.1	22.0 ± 1.4
ROL2	21.8 ± 1.9	25.5 ± 2.2	23.6 ± 1.5
ROL3	24.6 ± 1.8	26.7 ± 2.3	25.6 ± 1.4
Sand1	6.5 ± .7	9.0 ± .8	7.7 ± .6
Sand2	7.7 ± .7	10.2 ± .8	8.9 ± .5
Sand3	9.8 ± .8	11.9 ± .8	10.8 ± .6
Sand4	11.8 ± .9	14.3 ± .8	13.0 ± .6

Table 2.--Test-retest Reliability Coefficients of ROL and Sand Tests

Test	Group	Sand2	Sand3	Sand4
	Males	.86	.81	.77
Sand1	Females	.90	.87	.77
	Total	.89	.85	.78
	Males		.83	.71
Sand2	Females		.88	.72
	Total		.86	.73
	Males			.67
Sand3	Females			.82
	Total			.75
		ROL2	ROL3	
	Males	.94	.95	
ROL1	Females	.91	.94	
	Total	.92	.94	
	Males		.94	
ROL2	Females		.96	
	Total		.95	

Table 3.--Corrected Split-half Reliability Coefficients of ROL and Sand Tests

Test	Males	Females	Total
ROL1	.94	.95	.94
ROL2	.95	.95	.95
ROL3	.94	.96	.95
Sand1	.79	.91	.86
Sand2	.80	.85	.84
Sand3	.89	.86	.88
Sand4	.87	.80	.85

Table 4.--Mean Differences Between the Two Halves of the ROL and Sand Tests Used to Estimate Split-half Reliability

	Males		Females		Total	
	Mean Diff.	*t*	Mean Diff.	*t*	Mean Diff.	*t*
ROL1	.66	1.34	.00	.00	.34	.97
ROL2	.86	2.10	.70	1.45	.84	2.53*
ROL3	1.00	2.27*	.33	.72	.68	2.12*
Sand1	1.90	5.68*	2.26	8.06**	2.07	9.46**
Sand2	2.49	8.27**	3.15	10.31**	2.79	12.82**
Sand3	2.17	7.85**	2.37	8.23**	2.27	11.44**
Sand4	1.96	6.09**	2.38	6.50**	2.16	8.93**

*$p < .05$

**$p < .001$

Table 5.--Comparison of Sample and Norm Means of the Metropolitan Readiness Subtests

Subtest	Sample		Norm		t
	$\bar{X}$	SD	μ	σ	
Beg. Cons.	9.6	3.6	8.9	3.6	1.35
Soun. Let.	9.7	5.0	10.5	4.7	1.18
Vis. Mat.	6.7	2.2	6.8	2.2	.31
Find. Pat.	11.4	4.6	11.0	4.2	.66
Sch. Lang.	6.7	2.0	6.8	1.8	.38
List.	6.1	2.2	5.7	1.9	1.48
Quan. Con.	5.4	2.0	5.3	2.0	.34
Quan. Op.	10.3	3.4	9.9	3.5	.78
Auditory	19.3	7.7	19.4	7.8	.09
Visual	18.1	6.3	17.8	5.8	.36
Language	12.8	3.8	12.5	3.2	.65
Pre-Read. Comp.	49.7	16.8	49.7	14.4	.00
Quantitative	15.7	4.8	15.2	5.0	.69
Battery Comp.	65.8	19.7	64.9	18.7	.33

Table 6.--Correlations of the Record of Oral Language and Concepts About Print

	ROL ADMINISTRATION		
Sand Administration	ROL1	ROL2	ROL3
Sand1	.66	.65	.67
Sand2	.62	.65	.65
Sand3	.69	.72	.72
Sand4	.59	.64	.66

Table 7.--Intercorrelations of Metropolitan Subtests and Sand4

Subtest	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Beg. Cons.														
2. Soun. Let.	.57													
3. Vis. Mat.	.64	.53												
4. Find. Pat.	.63	.66	.67											
5. Sch. Lang.	.50	.42	.46	.52										
6. List.	.39	.43	.41	.52	.64									
7. Quant. Con.	.63	.50	.65	.50	.42	.38								
8. Quant. Op.	.56	.60	.58	.62	.40	.60	.55							
9. Auditory	.84	.92	.64	.73	.51	.46	.62	.65						
10. Visual	.69	.67	.84	.97	.54	.52	.60	.65	.76					
11. Language	.49	.47	.48	.57	.90	.92	.44	.56	.54	.59				
12. Pre-Read. Comp.	.73	.71	.76	.86	.71	.65	.57	.66	.80	.89	.75			
13. Quantitative	.66	.63	.68	.64	.46	.58	.81	.94	.72	.71	.58	.70		
14. Batt. Comp.	.80	.82	.78	.86	.66	.67	.72	.80	.91	.90	.73	.92	.87	
Sand4	.52	.71	.47	.57	.50	.51	.44	.61	.71	.56	.56	.61	.61	.72

Table 8.--Multiple Correlations

Criterion	Predictors		
	ROL1 Sand1	ROL2 Sand2	ROL3 Sand3
Beg. Cons.	.69	.69	.68
Soun. Let.	.63	.67	.58
Vis. Mat.	.59	.57	.59
Find. Pat.	.61	.63	.62
Sch. Lang.	.70	.67	.68
Listening	.71	.63	.66
Quan. Con.	.49	.44	.42
Quan. Op.	.68	.67	.63

Table 9.--Canonical Correlations of the Record of Oral Language and Concepts About Print with the Metropolitan Readiness Subtests

Test Date	Coefficients for Canonical Variables										Canon. Corr.
	First Set		Second Set								
	ROL	Sand	Beg. Cons.	Soun. Let.	Vis. Mat.	Find. Pat.	Sch. Lang.	List.	Quan. Con.	Quan. Op.	
With all Metropolitan Subtests											
Nov., 1977	.57	.52	.43	.09	.04	-.09	.31	.36	.22	-.12	.87
Feb., 1978	.59	.51	.46	.26	.04	-.05	.28	.21	.27	-.25	.85
Mar., 1978	.62	.46	.45	.10	.10	-.05	.35	.26	.26	-.26	.84
With Pre-reading Subtests of the Metropolitan											
Nov., 1977	.61	.49	.45	.11	.02	-.05	.27	.45			.86
	-1.18	1.23	-.90	.93	.72	-.05	-.30	-.08			.48
Feb., 1978	.62	.48	.44	.29	-.02	.01	.24	.31			.83
Mar., 1978	.61	.47	.42	.13	.04	.01	.30	.36			.82

Table 10.--Beta Weights and Multiple Correlation Coefficients Resulting from the Stepwise Regression Analysis of the Record of Oral Language, Concepts About Print, and Metropolitan Readiness Subtests

Criterion	Beta Weights				Mutiple R
	Sand	ROL	Age	Sex	
November, 1977 Sand and ROL					
Beg. Cons.	.37	.42	-.12	.08	.70
Soun. Let.	.56	.04	.02	-.13	.64
Vis. Mat.	.50	.10	.11	.08	.60
Find. Pat.	.34	.28	.14	-.12	.63
Sch. Lang.	.20	.53	-.03	-.21	.73
List.	.24	.50	.16	-.11	.73
Quant. Con.	.26	.26	.17	.07	.52
Quant. Op.	.31	.33	.37	-.09	.76
Auditory	.54	.22	-.04	-.04	.71
Visual	.42	.24	.14	-.06	.66
Language	.24	.57	.08	-.17	.80
Pre-Read. Comp.	.48	.30	.06	-.11	.76
Quantitative	.33	.34	.34	-.03	.75
Battery Comp.	.47	.36	.13	-.08	.81

Table 10.--Continued

Criterion	Beta Weights				Multiple R
	Sand	ROL	Age	Sex	
January, 1978 Sand and ROL					
Beg. Cons.	.43	.40	-.18	.11	.72
Soun. Let.	.50	.19	.02	-.13	.68
Vis. Mat.	.46	.14	.10	.08	.58
Find. Pat.	.31	.33	.11	-.10	.64
Sch. Lang.	--	.66	-.03	-.23	.70
List.	.19	.44	.13	-.10	.65
Quant. Con.	.23	.22	.15	.08	.47
Quant. Op.	.31	.31	.34	-.07	.74
Auditory	.53	.31	-.07	-.03	.75
Visual	.39	.29	.11	-.05	.67
Language	.12	.60	.06	-.18	.73
Pre-Read. Comp.	.36	.43	.05	-.11	.76
Quantitative	.32	.31	.30	-.02	.72
Battery Comp.	.43	.41	.09	-.06	.80
March, 1978 Sand and ROL					
Beg. Cons.	.21	.53	-.12	--	.69
Soun. Let.	.36	.23	.08	-.22	.63

Table 10.--Continued

Criterion	Beta Weights				Multiple R
	Sand	ROL	Age	Sex	
March, 1978, Sand and ROL					
Vis. Mat.	.52	.06	.12	.03	.60
Find. Pat.	.39	.24	.11	-.16	.65
Sch. Lang.	.21	.52	-.08	-.26	.72
List.	.29	.39	.12	-.15	.69
Quant. Con.	.06	.35	.19	--	.46
Quant. Op.	.07	.52	.39	-.17	.76
Auditory	.33	.40	--	-.14	.70
Visual	.47	.20	.13	-.11	.68
Language	.28	.50	.03	-.23	.77
Pre-Read. Comp.	.39	.38	.07	-.18	.77
Quantitative	.07	.51	.36	-.12	.73
Battery Comp.	.35	.44	.13	-.16	.80

Table 11.--Partial Correlations of Record of Oral Language and Concepts About Print with Metropolitan Readiness Subtests

Metropolitan Subtests	Partial Coefficients			
	Zero Order	First Order	Zero Order	First Order
	With Sand1	(ROL1[1])	With ROL1	(Sand1[1])
Beg. Cons.	.59	.27*	.66	.45
Soun. Let.	.63	.52	.41	.00*
Vis. Mat.	.58	.44	.43	.08*
Find. Pat.	.59	.40	.50	.19*
Sch. Lang.	.60	.28*	.67	.45
List.	.64	.38	.65	.40
Quant. Con.	.46	.27*	.43	.18*
Quant. Op.	.67	.50	.53	.17*
Auditory	.69	.50	.58	.24*
Visual	.64	.46	.52	.17*
Language	.68	.40	.73	.51
Pre-Read. Comp.	.72	.54	.62	.27
Quantitative	.67	.48	.55	.21*
Battery Comp.	.77	.59	.67	.34
	With Sand2	(ROL2)	With ROL2	(Sand2)
Beg. Cons.	.60	.30	.66	.44
Soun. Let.	.66	.50	.52	.16*

Table 11.--Continued

Metropolitan Subtests	Partial Coefficients			
	Zero Order	First Order	Zero Order	First Order
	With Sand2	(ROL2)	With ROL2	(Sand2)
Vis. Mat.	.56	.40	.44	.12*
Find. Pat.	.59	.37	.55	.27
Sch. Lang.	.48	.09*	.66	.53
List.	.55	.28	.58	.35
Quant. Con.	.69	.22*	.39	.17*
Quant. Op.	.65	.46	.55	.22*
Auditory	.71	.50	.65	.35
Visual	.63	.42	.55	.25
Language	.57	.23*	.69	.50
Pre-Read. Comp.	.69	.44	.68	.42
Quantitative	.63	.43	.55	.24*
Battery Comp.	.74	.53	.70	.42
	With Sand3	(ROL3)	With ROL3	(Sand3)
Beg. Cons.	.56	.16*	.67	.46
Soun. Let.	.57	.37	.48	.12*
Vis. Mat.	.59	.44	.45	.04*
Find. Pat.	.61	.40	.52	.15*

Table 11.--Continued

Metropolitan Subtests	Partial Coefficients			
	Zero Order	First Order	Zero Order	First Order
	With Sand3	(ROL3)	With ROL3)	(Sand3)
Sch. Lang.	.60	.25	.65	.40
List.	.62	.34	.60	.28
Quant. Con.	.36	.10*	.41	.24*
Quant. Op.	.57	.25	.60	.33
Auditory	.64	.35	.63	.32
Visual	.65	.46	.54	.13*
Language	.67	.36	.69	.40
Pre-Read. Comp.	.71	.45	.66	.31
Quantitative	.55	.23*	.60	.34
Battery Comp.	.72	.45	.70	.37

[1]The variable in parentheses is controlled.

*$p > .05$

Table 12.--Factor Analysis of the Record of Oral Language, Concepts About Print and Metropolitan Readiness Subtests

	Unrotated Factor Matrix		Varimax Rotation Factor Matrix		Oblique Rotation Pattern Matrix	
Variable	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
ROL1	.75	.34	.34	.75	.05	.79
Sand1	.82	.13	.53	.64	.36	.53
Beg. Cons.	.78	-.17	.70	.38	.72	.11
Soun. Let.	.71	-.18	.66	.33	.69	.06
Vis. Mat.	.75	-.32	.78	.26	.89	-.11
Find. Pat.	.79	-.16	.70	.40	.71	.12
Sch. Lang.	.70	.32	.31	.70	.04	.73
List.	.72	.41	.27	.78	-.06	.87
Quan. Con.	.68	-.28	.69	.24	.79	-.08
Quan. Op.	.76	-.28	.62	.45	.58	.24
Eigenvalue	5.58	.68				
% of Var.	89.2	10.8				
ROL3	.78	-.30	.36	.76	.06	-.79
Sand3	.79	-.24	.41	.72	.15	-.72
Beg. Cons.	.78	.19	.69	.40	.70	-.14
Soun. Let.	.71	.14	.61	.39	.60	-.17
Vis. Mat.	.76	.32	.77	.30	.85	.05
Find. Pat.	.79	.13	.67	.45	.64	-.21

Table 12.--Continued

Variable	Unrotated Factor Matrix		Varimax Rotation Factor Matrix		Oblique Rotation Pattern Matrix	
	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
Sch. Lang.	.69	-.30	.30	.69	.01	-.74
List.	.70	-.35	.27	.73	-.05	-.81
Quan. Con.	.67	.35	.73	.21	.85	.14
Quan. Op.	.76	.06	.59	.48	.52	-.29
Eigenvalue	5.55	.66				
% of Var.	89.4	10.6				